Such a plan would provide advanced training for all graduates.

County Hospital.

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SYNOVIAL POLYSACCHARID

According to Dr. Karl Meyer[1] and his colleagues of the Arthritis Clinic, Presbyterian Hospital, New York City, human synovial fluid contains a specific polysaccharid, chemically identical with the mucoid polylsaccharid elaborated by Group A Hemolytic streptococci. If this identity is confirmed, it would suggest a wholly new theory of arthritis and rheumatic fever and a newly plausible basis for therapeutic research.

Highly specific lipoids, polysaccharids and other chemical factors common to pathogenic microorganisms and animal tissues, have been a subject of research interest since Forssman[2] discovered the first heterophil lipoid of this type. This "Forssman lipoid" is found in certain strains of intestinal bacteria, and in conjugation with the tissue proteins of certain animal species. It is present, for example, in exceptionally high titer in guinea pig and horse tissues, but is absent from man and the rabbit. If a Forssman-positive vaccine is injected into a Forssman-negative animal (*e. g.*, a rabbit), a high-titer anti-Forssman antibody factor or function is formed. A Forssman-positive animal, however, is apparently incapable of forming these fractional antibodies, or, if formed, rapidly removes them from the circulation by conjugation with fixed tissue lipoids. An anti-Forssman serum injected into a Forssman-negative animal is nontoxic. Injected into a Forssman-positive animal, however, fulminating toxic symptoms may result. Thus, a Forssman-negative antiparatyphoid horse serum is nontoxic on intravenous injection into Forssman-positive guinea pigs. The homologous Forssman-positive rabbit antiserum, however, may cause lethal reactions.

The heterophil antigens of greatest current clinical interest, however, are certain lipoids and polysaccharids in type pneumococci. Since the same lipoids are normally present in horse tissues, an antipneumococcus horse serum is theoretically deficient in one antibody function essential for complete antipneumococcus humoral immunity. Theoretically at least, however, this handicap can be overcome by using rabbit antiserum. Of even greater practical interest is the heterophil carbohydrate, which is also present in human erythrocytes. Antipneumococcus horse serum, therefore, would theoretically be hemolytic or hemagglutinating for man.

Doctor Meyer's alleged identification of his synovial polysaccharid with the mucopolysaccharid of Hemolytic streptococci is based on chemical evidence. On acidulation, human synovial fluid yields about 225 milligrams of his polysaccharids per liter. Each molecule of this polysaccharid contains one equivalent of nitrogen, hexosamin, acetyl and hexuronic acid. It contains no sulfur or phosphorus. Identical fractional components in identical ratios were previously demonstrated by Meyer in polysaccharids isolated from vitreous humor and from the umbilical cord.[2] Almost identical qualitative and quantitative analyses have been reported by Kendall[3] and his coworkers for the mucopolysaccharid isolated from Hemolytic streptococci.

The apparent chemical identity of this streptopolysaccharid with synovial polysaccharid was confirmed by Meyer through a parallel study of their hydrolyses by the autolytic enzyme formed by type pneumococci. Within the limits of the experimental error this enzymic reaction was both qualitatively and quantitatively identical for both polysaccharids.

Since in their hands rabbits injected with heat-killed Hemolytic streptococcus did not yield precipitins or complement-deviating antibodies for the mucopolysaccharid, Kendall[3] and his coworkers concluded that the streptococcus mucopolysaccharid is "serologically inactive." The opposite conclusion is currently reported by Loewenthal[4] of London Hospital and Medical College, who found that by cautiously heating young mucoid phase streptococci (55 degrees, 12 minutes) so as to avoid denaturation, the streptomucopolysaccharid is antigenically active. Antigenic identity of the streptopolysaccharid and synovial polysaccharid, however, has not yet been confirmed by serologic evidence. Until this is done, an autocytotoxic theory of arthritis or rheumatic fever, a theory based on a presumptive immunological vicious circle, would be premature.

Box 51.

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Stanford University.

1 Meyer, Karl, Smyth, Elizabeth M., and Dawson, Martin, H.: Science, 88:129 (Aug. 5), 1938.

2 Meyer, Karl, and Palmer, J. W.: J. Biol. Chem., 114:689, 1936.

3 Kendall, F. E., Heidelberger, M., and Dawson, M. H.: *Ibid.*, 118:61, 1937.

4 Loewenthal, H.: Brit. J. Exp. Path., 19:164 (April), 1935.

Adequate Medical Services Available in Texas County.—An abundance of free clinics, governmental hospitals and philanthropic organizations in Harris County, Texas, makes it possible for every one to obtain medical care, the County Medical Society reveals in a study of medical care during 1937. The survey, reported in *The Journal of the American Medical Association* for January 14, is part of a nation-wide study being sponsored by the Association.

An average of eighty-five patients for each of the 266 physicians included in the study received free treatment in homes, hospitals or doctors' offices during the year. The physicians also reported they had devoted 27,971 hours to free patients in clinics.

A majority of the people, including the low-income groups, could obtain and pay for necessary dental service when they made proper arrangements for obtaining such service. During 1937 the thirty-four dentists included in the survey provided 994 persons with free care in their offices and gave 960 hours of free service in clinics.

Not a single instance of refusal to hospitalize patients was recorded. Facilities for the care of school children were considered adequate.

A social service filter system to prevent persons who can afford to pay from obtaining care at the free clinics and to make fees for low-income groups commensurate with ability to pay was strongly recommended.

Other needs of the county as seen by the Society included additional funds to provide medical care for persons with infectious diseases, especially venereal diseases, and for those with chronic ilnesses who need institutionalized care, and provisions by relief agencies for care of transients and nonresidents who are ineligible for county aid.